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ABSTRACT

In 1990, a study was conducted at Illinois Central College (ICC) to identify pre- and post-enrollment variables that could serve as predictors of student persistence and to compare persistence between vocational and academic program students. From a population of 656 Applied Science students and 671 Arts and Science students who were first-time, full-time, degree-seeking enrollees in fall 1987, a random sample of 75 students was selected from each group. Students were classified as persisters if, by fall 1989, they had graduated, had requested a transcript sent to a four-year institution, or were still enrolled. Pre-enrollment variables included age, gender, race, American College Testing Program (ACT) score, high school rank and class size, and stated educational goal. Post-enrollment data were obtained from student transcripts. Additionally, a telephone survey of persisters examined self-reported success factors. Study findings included the following: (1) no significant difference was found in persistence rates of vocational and academic program students; (2) among pre-enrollment variables, only ACT scores, student age, and high school percentile were found to be significantly related to student persistence; (3) grade point average and course withdrawal rates were the only significant post-enrollment variables; (4) students surveyed indicated that teachers were the institutional factor most important to their success, while family was the most important personal factor, followed by work, money and transportation. The survey instrument, tabulated survey results, and a 30-item bibliography are included. (JMC)

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ED325190

Persistence Among Full-Time Students at Illinois Central College

Rita Fischbach

June 7, 1990

JC 900596

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Introduction

Student retention has been a much studied phenomenon at the secondary and post-secondary levels. With the recent, growing emphasis on accountability and student outcomes, renewed interest exists at post-secondary institutions in improving student retention rates. This interest in accountability is evidenced by policy makers in Springfield, as well as by administrators at Illinois Central College.

In September 1989, the Illinois Board of Higher Education (IBHE) released two studies of student retention in September of 1989. Their first report, Retention and Graduation Patterns at Illinois Public Universities (IBHE, 1989a), is an analysis of retention and graduation patterns at public universities which went beyond the previous campus based studies. By incorporating current database techniques, it traced freshman students enrolled in 1980 through all 4-year degree institutions for a period of 8 years. The study found that 54% of freshman enrolled at state universities had graduated within 8 years. In addressing student retention at the community college, a second report, Improvement of Minority Student Baccalaureate Achievement Through Transfer (IBHE, 1989b) described the status of student transfer from associate to baccalaureate degree-granting institutions in Illinois, with particular emphasis on the transfer of minority students. This report found that during fiscal year 1988, 21.6% of the students in Illinois community colleges were enrolled in transfer programs and that only 8% of those students received transfer associate degrees. The media has also placed attention on the transfer rates of community college students. The Chicago Sun Times (November 12, 1989)

featured a series in November, 1989 which discussed the transfer rate of community college students and claimed that only 10% of community college students who intend to transfer do so.

The transfer function of the community college is not the only segment which has been under criticism. The National Assessment of Vocational Education (NAVE) used the High School & Beyond (HS&B) 1980 seniors and the National Longitudinal Study of the class of 1972 to follow student program completion (NAVE, 1989). The results of this study found that 17.1% of the HS class of 1980 who had entered the community colleges had received associate degrees in community colleges, while 23% of the high school class of 1972 completed the desired program. In both studies some students had transferred to other institutions while others were still enrolled in the first school entered. The departure rates, i.e. leaving without a degree or certificate, were 42% for the HS class of 1980 and 30% for the class of 1972. The study found no differences between students enrolled in academic and vocational-technical programs. Academic students were defined to be students pursuing two-year transfer degrees and vocational-technical students were those students who are pursuing terminal vocationally oriented degrees.

Problem Statement

This renewed concern about student retention has caused the administrators at Illinois Central College to investigate whether differences exist in the persistence rates of academic and vocational students. While there are several definitions for "persistence" for students attending a community college, in this study a student is

defined to be persistent if he or she transfers to a 4-year institution and/or completes an associate degree. The college administrators also need to understand the changing demographics of the student population enrolling at ICC and how demographic factors, such as age and race, are associated with predicting success or failure at ICC. Knowing which factors predict persistences may assist administrators in determining the programs and services that should be instituted to help students who are likely to fail. A third topic of interest is which factors predict persistence once the student enrolls at the institution. A related concern of the college was knowing exactly what institutional factors students found helped and hindered them in progressing towards a degree. This information would be helpful in marketing the strengths of the college to potential students and strengthening its programs and support services for students currently enrolled.

Research Questions

To address the above concerns the following research questions are addressed in this paper:

Question 1. Does the persistence rate of vocational students (i.e. those pursuing applied science degrees) differ from that of academic students (i.e. those pursuing arts and science degrees)?

Question 2. What pre-enrollment factors can be identified as predictors of persistence?

Question 3. What post-enrollment factors can be identified as predictors of persistence?

Definition of Terms

For the purpose of this paper the following definitions describe

the classifications for students examined in this study.

Graduate: student who received an applied science (AS) or an arts and science (AAS) associate degree

Transfer: student who indicated transfer by requesting a transcript be sent to a 4-year institution but did not graduate

Attendee: student attending Fall 1989

Leaver: student who did not graduate, transfer or was not attending

Persister: graduate, transfer, attendee

Non-persister: leaver

Review of the Literature

This section provides a brief overview of the major studies of college student retention. It examines their findings (e.g. variables associated with persistence in college) and research designs.

Predictors of Persistence

Astin's 1975 study of student persistence analyzed students from the 1972 NLS study. In this analysis of students who were seeking Bachelor's degrees, Astin described persisters as students who had graduated, were seeking a higher degree than a Bachelor's, or were still enrolled in college. In this classic study, the term "stop-out" and "drop-out" were both defined. A stop-out is a student who fails to attend school for at least one semester and then later returns to the institution. Astin grouped both voluntary leavers and non-voluntary leavers together claiming that it is difficult to distinguish between the groups since some may voluntarily leave due to poor grades and others may allow grades to drop once the decision to leave is made.

A theoretical model of the factors which affect student

persistence or "departure" was proposed by Bean in 1975. Attempts to verify and refine this classic model have been made by many researchers (Pascarella & Terenzini, 1980; Pascarella & Chapman, 1983; Plascak & Bean, 1988; Webb, 1988; Whitaker, 1987). In Bean's model, institutional fit is a match of the strength of an institution to student needs. Social integration is defined as "finding a social niche in which students share values and support each other through friendship and mutual concern for each other's well being". While Bean's model suggests institutional fit, social integration, and student loyalty as the best predictors of student retention, recent studies involving commuter colleges have found the model quite unsatisfactory (Plascak & Bean, 1988; Webb, 1987; Pascarella, Dubi & Iverson, 1983; Pascarella & Chapman, 1983). These studies have found that factors which are non-predictive for the residential colleges such as gender, race, age, and high school graduation class size, and environmental factors, do predict persistence for commuter students. In particular, external environment, which is defined to be those things over which the college has little control, such as family, health and student jobs, has a direct effect on student retention (Webb, 1988). Intention, the educational goal of the student, is also a predictor of student persistence (Pascarella, Dubi & Iverson,1983). These community college studies have found that academic integration (e.g. development of proper attitudes towards integrity, delayed gratification and valuing scholarship) is more of a factor in commuter students attrition (Plascak & Bean, 1988; Webb, 1988). GPA is a major contributor to academic integration. Faculty interaction, such as

informal faculty-student contacts can have an effect on this academic integration which appears to be the strongest predictor (Bean, 1987). Tinto (1987) in Leaving College states that faculty interaction may be even more important for marginal students at commuter institutions than at residential institutions.

A recent model proposed by Pascarella, Dubi and Iverson (1983) modified Bean's original model by incorporating the findings from commuter colleges. In this model academic integration provides a direct effect, with social integration negligible. A copy of this path analysis model appears in Attachment A.

At the local level, a previous study by Preller (1972) investigated the differences in persistence at Illinois Central College using the following variables: gender, ACT, intent, high school percentile rank, race, and high school size. In this study of the college during the first four years of its existence, Preller found that the only pre-enrollment factor which showed significance when using the number of semesters as a measure of persistence was high school graduation class size.

Research Designs for Retention Studies

There are three different types of studies of retention: autopsy, cross-sectional and longitudinal (Bean, 1987). An autopsy model studies the students after the fact, once the students have left the institution. While a longitudinal study is certainly the preferred type, a cross-sectional study can give a description of the students at a point in time upon which other studies can be built. Although there exists much research on student retention, typically each institution

has done their own study to fit the particular questions they are addressing and the available data sources. The results can be used both as a benchmark to investigate change over time and for other institutions to use for comparative purposes (Bers, 1988).

Methods and Procedures

Illinois Central College is a large comprehensive community college located serving a rural-suburban-urban region of central Illinois. The college has approximately 12,000 students enrolled, with a full time equivalent enrollment of 5,000 students. As is common in community colleges, many students attend only on a part-time basis. Little pre-enrollment data exists for the part time students due to the application process for part-time students. Therefore, for the purpose of this study the decision was made to concentrate on full time students who had at the time of their initial enrollment, the goal of obtaining a two year associate degree. Full time students who had fewer than 11 hours were considered as new entering students. College data tapes of 1986-1989 were reviewed and the Freshman class of Fall, 1987 was selected as the cohort group since two years would have passed since initial enrollment. This allowed the investigator the opportunity to determine student graduation rates and to reach students for follow-up questions.

Sample

From a population of 656 Applied Science students and 671 Arts and Science students, who enrolled for the first time in Fall 1987 as full time students, a random sample of 75 students was selected from each group. This provided an 11% sample from each population. The selection

was done by the investigator using a table of random numbers. A cross-sectional study which would study the students at this moment in time, rather like a snapshot, was selected as the sampling design, with the intention that this study would become the basis for a larger longitudinal study.

Variables

Pre-enrollment data which were available from the data tapes and which had been found to be predictors of student persistence in other studies included: birthdate (i.e. age), gender, race, ACT score, high school rank, high school graduation class size, and intent (e.g. goal). The self-reported variables were race and intent. "Intent", an item scale, included as responses: prepare for new career, improve skills, explore courses, transfer to a 4 year school, remedy basic skills, personal interest, prepare for HS diploma, and other. The post enrollment data was obtained from a review of transcripts. Transcripts of the 150 students in the sample were obtained and the following information was compiled: the number of semester hours enrolled each of 5 semesters and the number of semester hours completed for the first 4 semesters. Enrollment during summer sessions was not included in this study. Also, since there was some thought that withdrawal rates might be a predictor of success, the number of semester hours withdrawn each semester was recorded. Withdrawal rate was defined to be the number of hours from which the student formally withdrew divided by the total number of hours attempted. A grade point code from 0-8 was coded for each semester, with 8 being equivalent to a 4.0. The official ICC definition of full time is being enrolled in 12 or more hours. The

number of semesters that the student attended full time was determined, with 9 hours or more being selected as full time after the first semester. The college requirements for participation on speech and athletic teams have this 9 hour requirement. In order to provide for reliability in the transcript analysis, each transcript was analyzed by both the investigator and another individual trained in transcript analysis. Discrepancies in the data were corrected following independent reviews of each transcript.

Since 66% of students who transfer from community colleges to 4 year schools in Illinois have not completed an associate's degree (ICCB, 1984) student transfer was defined in the following manner. Students who had earned more than 15 credit hours, who had a transcript sent to a 4-year institution and who were no longer attending ICC were coded as having transferred.

The intent code variable was redefined using three indicators appropriate for this study. The responses of "transfer to a 4-year school" and "prepare for a new career degree" were determined to be directly relevant to the study. The limited number of responses in the other 5 categories were grouped together as "other". A graduation code was established as indicated in Table 1. A persistence code was also established using a modification of Astin's (1975) definition of persistence. Student's were considered to have persisted if they had graduated, assumed to have transferred, or were still in attendance.

TABLE 1

Study Variables

Pre-enrollment:	Post enrollment:
Degree type	Number of hours per semester 5 semesters
1 Associates Arts and Science	Number of hours withdrawal per semester
2 Associates Applied Science	Grade point per semester
Sex (Gender)	0 0.00 - .49
1 Male	1 0.50 - .99
2 Female	2 1.00 - 1.49
Race	3 1.50 - 1.99
1 White	4 2.00 - 2.49
2 Non-white	5 2.50 - 2.99
Age	6 3.00 - 3.49
Age in years in 1987	7 3.50 - 3.99
ACT	8 4.00
Composite ACT score	Withdrawal rate
HSPercentile	Total hours withdrawn/Total hours
High school graduation class percentile	Graduation code
HSSize	0 Did not graduate or transfer
High school graduation class size	1 Transferred
0 1-99	2 Graduated
1 100-199	Persistence code
2 200-299	0 Leaver
3 300-399	1 Graduated, transferred, enrolled
4 400-499	
5 500-599	
Intent	
0 other	
1 prepare for a new career	
2 transfer to a 4 year school	

Statistical Analysis

The data were analyzed using SPSS X using frequency diagrams, T-tests, analysis of variance (ANOVA), analysis of covariance (ANCOVA), scatterplots to determine correlation, regression on pre-enrollment and post-enrollment variables, and discriminant analysis. A two tailed T-

test was used to answer the first research question- whether there was a difference in number of semesters attended between AS and AAS students. An equality of proportions test was used to determine whether there were differences in persistence rates between AS and AAS students. Equality of proportion tests were also used to determine whether there were differences in persistence rates on the variables of gender, race and intent. ANOVA was used to determine whether mean ACT scores differed between persisters and non-persisters.

Stepwise regression was used on the pre-enrollment variables of age, sex, race, intent, ACT, and high school rank to determine which factors predicted persistence.

Stepwise regression was used on the post-enrollment variables of GPA and withdrawal rates. Pascarella and Chapman (1983) reported that student's academic integration is determined primarily by the student's academic performance. GPA as a measure of academic integration has been reported earlier to be the major predictor of success. Withdrawal rate had not been used in any of the literature and, thus it was a speculative concept as a predictor.

Discriminant analysis was used to determine which variables distingushed between the three groups: those who had graduated, those who had transferred and those who had done neither. The dependent variable was graduation code.

Survey

The quantitative methods above describe the sample but do not address the question of what qualitative factors might affect student

persistence. To find what factors students thought affected their success in persisting, a telephone survey was developed with the assistance of the Vice-president for Planning and Information Services (Attachment B).

The autopsy approach of asking students who had departed or dropped out to identify the factors that influenced their decision has often resulted in biased responses (Astin, 1975). This technique was considered but not adopted since previously the technique had proven unsuccessful. In a recent report completed for the college by the Director of Advisement and Assessment students were sought who had left the college with GPA's of 0.0. Many students could not be found and no students reported academic failure as a reason (Teal, 1989). The need for students to report a reason which is socially acceptable has been described by both Bean (1987) and Astin (1975).

The decision was made to ask students who were successful what factors helped them to persist. The students from the sample of 150 who either transferred, graduated or were still attending were telephoned to attempt to identify the following: if and where they were in school, if they were employed, whether they were employed in the degree area, and what their current goals were. Also, the survey sought to identify: what institutional variables affected their success, what personal factors aided them, what institutional factors were difficult to overcome, and what personal factors were difficult to overcome. An open-ended question as to what the college could do to assist students was also asked.

The survey was pilot tested with six students who were in the

original population, but not part of the sample. The telephone survey was done by persons other than the investigator to avoid biasing the results as recommended by Graves and Kahn (1979). The telephone interviewers selected had experience at the college as students and were familiar with the college environment. Formal interviewing instructions were given to the interviewers and an opportunity was provided for them to ask questions about the survey. Each interviewer practiced the survey under supervision of the investigator. The interviewers worked together and were monitored by the investigator. The time period selected was the Christmas vacation in order to improve response rates by reaching students who were away at college.

Limitations of the Data

The pre-enrollment data were limited by the following missing data: not all students had high school transcripts sent to the college, not all students had ACT scores, and the self reported information of race and intent was not completed by each student at the time of admission.

Students were assumed to have transferred if a transcript had been sent to a university or college and the student was no longer attending ICC.

Another limitation in the data (and thus was not addressed in the study) was the frequency with which students changed programs and curriculums. Students who began in applied science degree programs did not necessarily remain in these programs. The original intent may have been incorrectly marked by the student or the student may not have understood the difference in degree programs at the time of enrollment.

Results

The results of the study will be organized in the following manner. First, a description of the sample will be given in terms of persisters and non-persisters. Second, the sample distribution of leavers, transfers, graduates and attendees will be described. Next, the research questions will be answered. Finally, the results of the telephone survey will be presented.

A Description of Persisters and Non-persisters

The results of the study show that in the sample, the percentage of persisters as defined above was 55% persisters and 45% non-persisters with the differences between AAS and AS students as indicated in Figure 1. The persistence rate is very similar for the two groups.

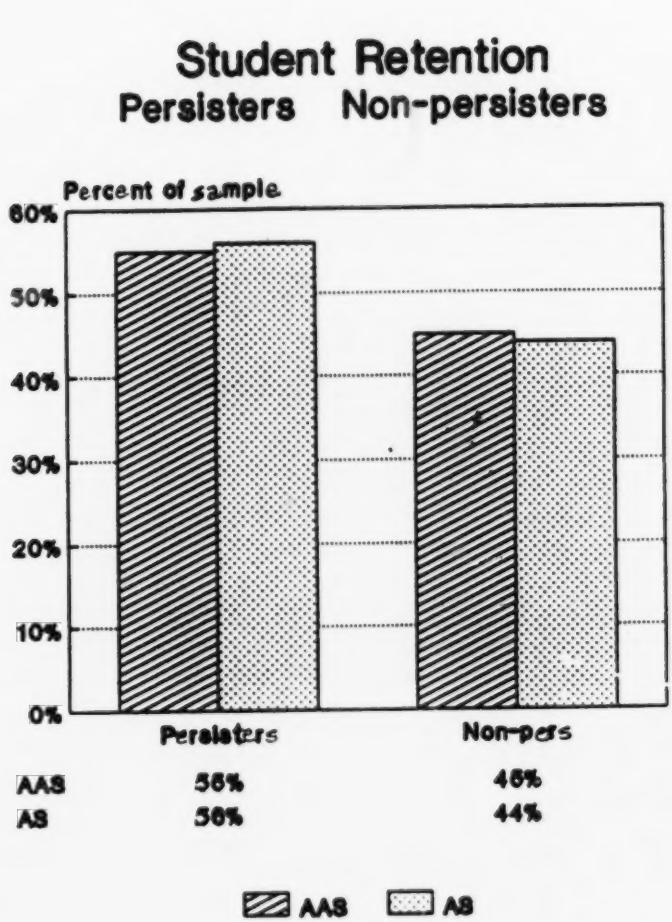


Figure 1. Percent of persisters and non-persisters in AS and AAS degree programs.

The distribution of persisters, classified as transfers, graduates and students still attending, is given in Figure 2. From the sample of 150 students, 67 students left the college, 34 in arts and science, and 33 in applied science. Twenty-four students had graduated during the two year period, 11 in arts and science and 13 in applied science. The number of non-graduate transfers was 14 students, with 11 in arts and

science and 4 in applied science. Forty-five students were still in attendance during the Fall of 1989, with 19 in arts and science and 26 in applied science.

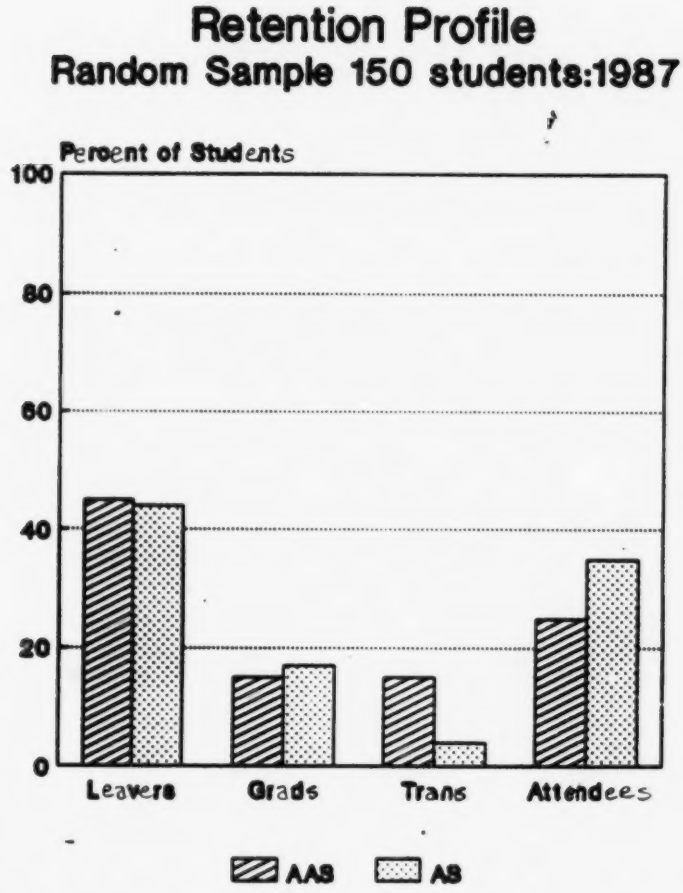


Figure 2. Distribution of persisters classified as transfers graduates and students till attending.

The students who left, which are those who neither stopped-out and returned, transferred nor graduated, did not vary greatly from semester to semester. The number of students who left each semester was highly consistent across all four semesters: 17, 15, 17, and 17. This is in conflict with the literature which claims that most students who leave do so before the first grading period (Webb, 1988; Whitaker, 1987). Figure 3 shows the distribution of students who left after each of the four semesters which were analyzed during the study.

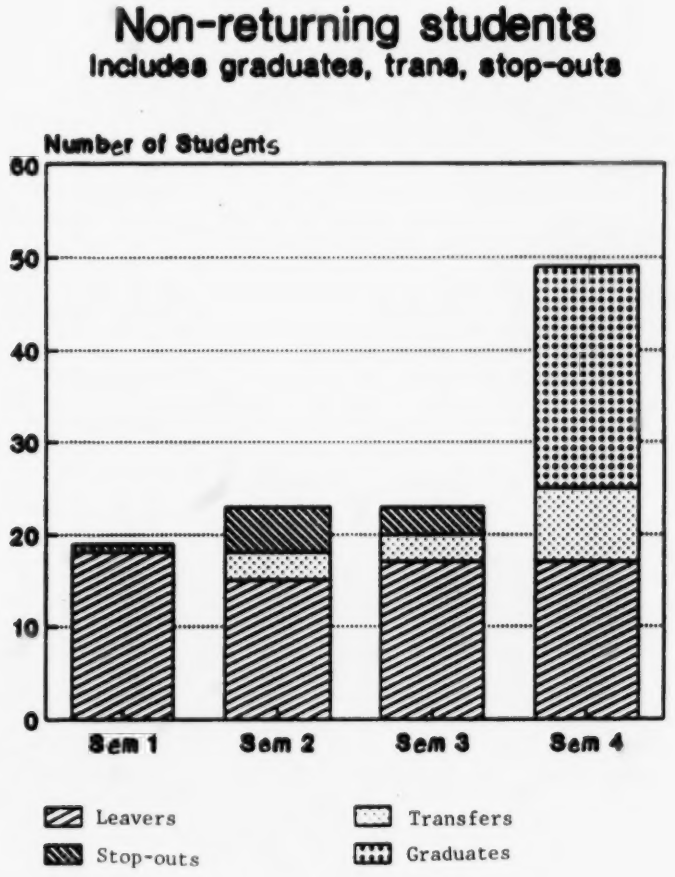


Figure 3. Distribution of leavers by semester.

Research question 1

Does the persistence rate of AS students differ from that of AAS students?

Due to the more personalized advisement by students in career programs and the close-knit environment of these programs it was thought that applied science students might be more likely to persist than students in transfer programs. A t-test using the number of semesters from 1 to 5 as a measure of persistence showed non significance in comparing the two groups. (see Table 2)

Table 2

Two-tailed T-test

Group	Mean	Std D	df	T	p
AAS	2.5867	1.415	148	-1.05	.296
AS	2.8267	1.389			

Note: Dependent Variable = number of semesters (N=150)

To test whether the proportion of students who persisted was equal in the two groups of students (AAS and AS) an equality of proportions test was performed. Using the definition of persistence where a student is considered to persist if he/she has graduated, transferred or is still attending, instead of the number of semesters, once again there was no significant difference in the two groups, as indicated in Table 3.

Table 3

Equality of Proportions

Group	n	x	Per cent	Z	p
AAS	75	41	.5467	.172	.871
AS	75	42	.5600		

Note: Dependent Variable = persistence (N=150)

Since students in career programs tend to come from lower academic high school groups (NAVE, 1989), this factor might mask the difference in persistence between academic and vocational students. A crosstabs was done on high school rank with the two groups. Six more students in the academic group were in the upper 50 percentile than in the vocational group. An ANCOVA was done with academic and career groups using high school class rank as the covariate. This also showed no significance in persistence between the two groups. It should be noted that only 111 pieces of data could be used, since class rank data were missing for 39 students.

Table 4

ANCOVA

Source of Variation	Sum of Squares	df	Mean Sq	F	Sig of F
Covariates					
Percnt	1.959	1	1.959	8.947	.003
Main effects					
Code	.168	1	.168	.767	.383
	.168	1	.168	.767	.383
Residual	23.864	108	.219		

Note: Dependent Variable = persistence (n=111)

An equality of proportions test investigating race as a factor in persistence found race to be barely significant at p<.048. A small sample of only six minority students and the fact that there were 6% non responders to race suggests that this is not a statistically significant factor. The nine non-responders to race was evenly divided with 5 being non-persisters, and 4 persisters. The persistence rate of non-whites does appear much lower than that of whites as reported in the IBHE study (IBHE, 1989b). Using 1 as a measure of persistence over a two year period, the mean for the 135 white students was .5778 while that of the non-white students was .1667. Gender, which was found to be a contributing factor in community college persistence by Pascarella, Dubi & Iverson (1983) showed no significance with p=.151 although females did better than males. Intent did not seem to be significant with a p=.206.

Table 5

Equality of Proportions test

Group	n	x	Percent	Z	p
Race					
White	135	78	.578	2.00	.048*
Non-white	6	1	.167		
Gender					
Male	73	36	.493	-1.44	.151
Female	77	47	.610		
Intent					
New career	38	18	.481	-1.28	.206
Transfer to a 4-year school	42	17	.415		

Note: Dependent variable= persistence (N=150) *p<.05

Previous studies have indicated that ACT is a factor in persistence (Pascarella, Dubi & Iverson, 1983). In analyzing the data for this sample, ACT did seem to be a factor. An ANOVA of ACT by Persistence found ACT scores to differ between persisters, with $p<.001$. (see Table 6)

Table 6

ACT	Mean	Std dev	cases
Pers			
0	14.558	4.953	43
1	17.580	4.846	69

ANOVA

Source	Sum of Squares	df	Mean Sq	F	Sig of F
Main Effects					
Pers	241.861	1	241.861	10.722	.001*
Residual	2481.416	110	22.558		

Note: ACT by Pers (n=111)

In recent efforts to encourage high school consolidation in Illinois, the Illinois State Board of Education (ISBE) has suggested that high school size is a factor in student performance at the post-secondary level (ISBE, 1985). In this study, the ISBE claims that students from small high schools, those less than 500 students, do not perform as well as those from larger high schools. In his study of

Illinois Central College, Preller found the opposite to be true, with students from smaller schools performing better. In analyzing high school graduation class size as a variable in this study, with the number of semesters as a measure of persistence as was done by Preller, no significance was found. (see Table 7) Clustering the graduation class sizes into two groups, with students in graduation classes with 100 or fewer students being one group and those in classes greater than 100, the other group showed no significance. (see Table 8)

Table 7

Numsem by HSSize using six groups

HSSize	Mean	Std Dev	Cases
0	2.933	1.413	30
1	3.034	1.636	29
2	2.906	1.422	32
3	3.333	1.225	9
4	1.667	2.082	3
5	3.333	1.118	9

ANOVA

NumSem by HSSize using 6 groups

Source	Sum of Squares	df	Mean Sq	F	Sig of F
Main Effects					
HSSize	7.745	5	1.549	.726	.605
Residual	23.500	106	2.134		

Note: (n=112)

Table 8

Numsem by HSSize using 2 groups

HSSize	Mean	Std Dev	Cases
1-100	2.933	1.412	30
101-600	3.000	1.474	82

ANOVA

Source	Sum of Squares	df	Mean Sq	F	Sig of F
Main effects					
HSSIze	.097	1	.097	.046	.831
Residual	233.867	110	2.126		

Note: (n=112)

Pre-enrollment Factors Predicting Persistence

Selected pre-enrollment factors have predicted persistence in other studies (National Longitudinal Study of High School Seniors (NLS), 1977). The NLS, 1977 study found that the background characteristics of non-persisters differed significantly from persisters. To verify this finding in this study, stepwise linear regression using all pre-enrollment factors was used focusing on the following factors: age, race, gender, HS percentile, ACT, and intent. The only factors which entered into the equation were HS percentile and age. HS percentile contributed .19, age added only an additional .05 to R-square. The average age of students at college entrance was 20.7 and 80% of all students were under age 21. The results of the stepwise linear regression are found in Table 9.

Table 9

Multiple Regression on Pre-enrollment variables

Variable entered on step number 1
Percnt R-square .19962

Variables in the equation				Variables not in the equation		
Variable	B	BETA	Sig T	Variable	Beta in	SigT
Percnt	.0099	.4468	.0002	Race	.189	.0932
(constant)	.164		.2657	Gender	.075	.5149
				Age	.222	.0492
				ACT	.167	.1959
				Int	.120	.2908

Variables entered on step 2
Age R-square .2483

Variables in the equation						
Variable	B	Beta	Sig T			
Percnt	.010	.4755	.0001	Race	.189	.0846
Age	.034	.0169	.0492	Gender	.118	.2976
(constant)	-.512		.1669	ACT	.148	.2442
				Int	.072	.5301

Note: Dependent Variable = Persistence (N=150, n=64)

With an R-square of .248 only 25% of student college persistence can be predicted by the stated pre-enrollment factors. This low level of prediction is supported by previous studies which included SES as well as the above variables. These studies found results varying from .17 to .228 (Whitaker, 1987; Pascarella & Chapman, 1983; Pascarella, Smart & Etherton, 1986). A major limitation of the regression analysis is that only 64 of the 150 records provided all pieces of data.

Post-enrollment Factors Predicting Persistence

GPA is the key factor in predicting success. This measure of academic integration has been a major factor reported in recent studies involving commuter students (Pascarella, Dubi & Iverson 1983;

Pascarella, Smart & Ethington,1986; Plascak & Bean, 1988).

While the investigator was analyzing the transcripts it seemed that withdrawal patterns might also be a potential predictor of persistence. Withdrawal in this study means formal withdrawal from one or more registered courses. Construction of a scattergram depicting the total hours withdrawn and persistence indicated that withdrawal might be a negative predictor of persistence. Stepwise regression using GPA and withdrawal as independent variables with persistence as the dependent variable entered GPA on step one with an R-square of .378, with withdrawal being entered on step 2 and contributing an additional .06. The two variables, GPA and withdrawal, contribute 43% to the prediction of student persistence. Table 10 summarizes the results.

Table 10

Multiple Regression on Post-enrollment variables

Variable entered on step number 1
GPA R-square .3779

Variables in the equation				Variables not in the equation		
Variable	B	BETA	Sig T	Variable	Beta in	SigT
GPA	.3424	.6145	.0000	Withdrs	-.1910	.0061
(constant)	-.1654		.0465			

Variable entered on step number 2
Withdrs R-square .4091

Variables in the equation			
Variable	B	Beta	Sig T
GPA	.3019	.5419	.0000
Withdrs	-.5220	-.1910	.0061
(constant)	.0013		.9900

Note: Dependent Variable = Persistence (N=150, n=150)

Defining student academic success as having a GPA greater than or equal to **2.0** shows a marked difference between persisters and leavers. Figure 4 presents a bar chart indicating the percentage of academically successful students, with success being defined as having a grade point greater than or equal to **2.0**. The figure shows a considerable difference in the academic success rates of persisters and non-persisters.

From these data it appears that academic non-success is certainly a characteristic of leavers.

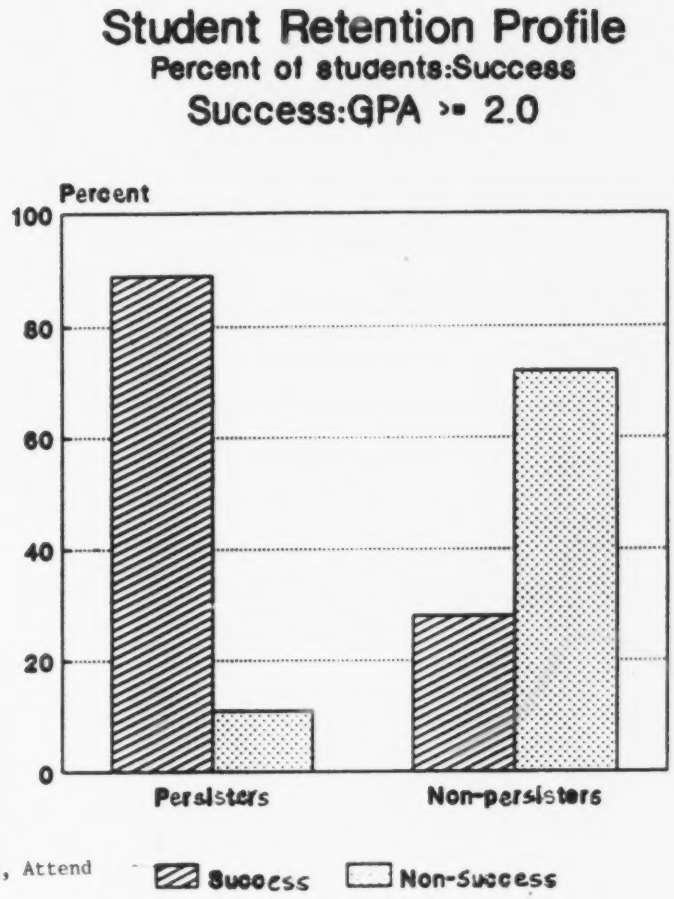


Figure 4. Distribution of persisters and non-persisters with GPA >= 2.0

Discriminant analysis was used to determine linear combinations of the predictor variables that show large differences in group means. The graduation code, which was coded 2 for graduates, 1 for transfers and 0 otherwise was used as the dependent variable. The first discriminant function was found to be significant at alpha=.0001, while the second discriminant function was not significant. GPA was the most heavily weighted variable for the first discrminant function. Withdrawal rate is the most heavily weighted variable for the second discriminant function. (Table 11) A graph of the group centroids indicates that the first discriminant function separates graduates and transfers from those who are not persistent, while the second discriminant function, though not significant, seems to separate graduates from transfers. (Figure 5)

Table 11

Discriminant Analysis by Graduation code

Function	Eigenvalue	Wilks' Lambda	df	Sig
1	.3618	.7191	10	.0000 *
2	.0211	.9793	4	.6363

Standardized Canonical Discriminant Function Coefficients

Variable	Function 1	Function 2
GPA	.9478	.3122
Withdrws	-.1345	.8346
Race	-.1206	-.4786
Age	-.2229	.2486
Gender	.2556	.2339

Canonical Discriminant functions evaluated at group centroids

Grad Code	Function 1	Function 2
0	-.301	.005
1	1.235	.210
2	1.044	-.454

Note: * p < .001 (n=128)

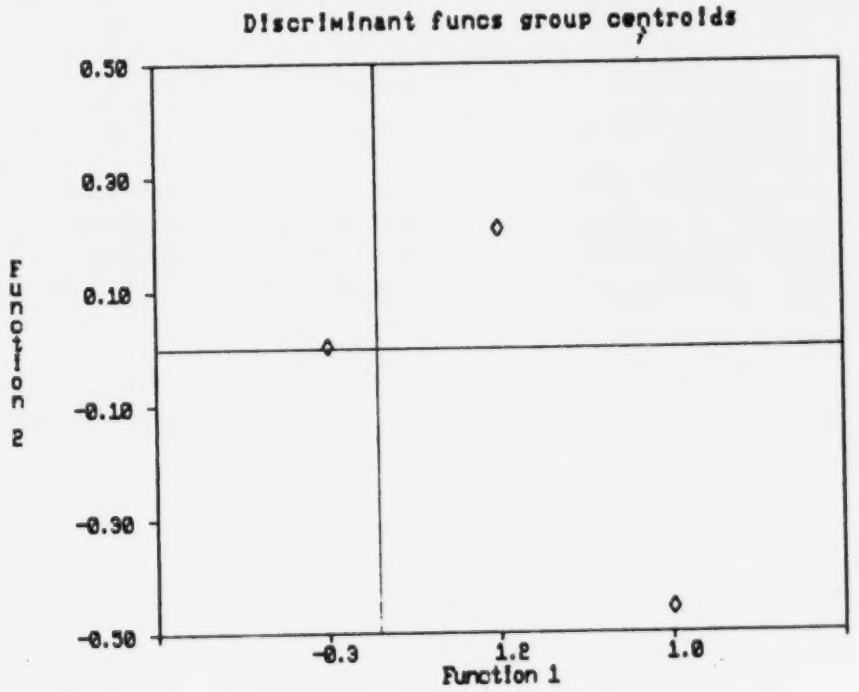


Figure 5 Discriminant functions evaluated at group centroids.

Survey Results

The response rate from the follow-up telephone survey was 74% of the 83 students. This 74% response rate was considered quite successful. In discussing response rate from telephone surveys, Graves and Kahn (1979) state that a 70% response rate compares favorably with

a questionnaire response rate of 74%. Each student was called at least three times at various times of the day to maximize the response rate. As be expected, several phones were disconnected and a few students left no phone numbers in the ICC records.

The results of the survey of the 38 students who had graduated or transferred were compiled separately from the 45 students who were still attending and can be found in Attachment C. From the 38 graduates and transfers there were 28 responders with 20 being in school full time and with one attending part time. Thirteen different colleges were represented by these 21 students. Some respondents cited multiple reasons for the institutional and personal factors which influenced their success favorably and unfavorably.

Among the 28 students surveyed, the institutional factor which students stated had the greatest influence on their success was their teachers, with 15 students so responding. Location-convenience was next in importance, with 7 responses. Program offerings, schedule of classes, and advisers were all cited by 3 to 5 students. Social life and special services were not mentioned.

Among the positive personal factors stated by students, family was most important (14) followed by work, money, and transportation all of which were cited by four students. Three students cited other items such as motivation and a coach. The personal factors which were most difficult to overcome were: money (7), transportation (6), with work and "other" each receiving three responses. The open ended question, what other assistance could the college have provided, resulted in 15 students responding with "none", three students giving no response and

10 citing the suggestions in Attachment C.

The results of the survey for students still in attending ICC are found in Attachment D. The 35 students still attending who responded stated that teachers and convenience-location were the major institutional factors contributing to success. Family was also the major positive personal contributing factor for this group. Twenty-one students responded that there were no personal factors which were problematic, while money and work were cited by a few. The open ended question also found 26 students indicating that there was nothing additional which the college could do to improve their success. Four students cited counseling as a difficulty. This level of satisfaction with the community college's programs and services by successful students exceeds that found in a study of Wyoming community colleges (Wyoming Community College Commission, 1988) which found 64% of students responding that there was nothing more that the college could do to help them succeed.

The telephone survey data were also analyzed to determine what factors distinguish students who graduate within two years from those who are still in attendance. The one factor in the survey which seemed quite different between the two groups was the number of hours worked by students, and the number of students who worked. Eleven of the twenty- eight students who had graduated or transferred had worked more than twenty hours per week, while 25 of the 35 students who were still in attendance worked more than twenty hours per week. This result supports previous research that environmental factors influence community college students (Webb, 1988).

Both groups of students reported that teachers had a positive impact on their success. This response of faculty having impact on student success is supported by many other studies and will be addressed in the recommendations (Webb, 1988; Endo & Harpel, 1982; Cohen, 1988; Pascarella & Terenzini, 1980).

Conclusions

This study examined student persistence and a set of related predictive factors at a major Illinois community college. Transcript and telephone survey data were used to identify a series of factors related to completion of associate degree programs by full-time students. From a total enrollment of 12,858 students of which 3,732 were full time during the Fall of 1987, 1,327 full time degree seeking freshman were selected as the population to be studied.

When compared to other community colleges the drop out rate at Illinois Central College is not as high as that reported by others. The drop-out, leaver, and departure rate of 41 of the 150 students or 27% after freshman year is far less than that reported by ACT (1989) of 47% for all community college students. In fact, it is similar to that which is reported by ACT for BA/BS institutions. Tinto (1987) reported a 46% freshman attrition rate for 2-year institutions with open admissions policies. Compared with Flaherty's (1989) transfer study of Chicago area community colleges which reported a transfer rate of 10%, 22 students out of the original 75 students (29%) who were originally enrolled in the two year transfer program did transfer. Even if one doubled Flaherty's rate to account for the two years of the program, ICC students do better. Although the demographics of the Chicago area

are quite different from central Illinois, the mission of the community college is similar. The ICC 45% attrition rate appears similar to that reported by NAVE (1989). However, students at Illinois Central do not leave mainly after the first semester. Student attrition appears to be a continuous process spread evenly throughout the 2 years. There is no difference in persistence rates of different groups of students. The only factor which seems to be predictive in pre-enrollment variables is HS percentile rank, however that only contributes 20% of the variance in student persistence. With regards to post-enrollment variables, academic integration (i.e. GPA) seems to be the only major predictor with withdrawal being a secondary indicator of importance.

The importance of academic success as a predictor of student success (i.e. student completion) has been recognized by the college for several years. A program exists to identify and assist students who are academically at risk. This program aids students whose grades fall below a 1.9 by providing special advisement and mentoring by department chairpersons. The students are encouraged to take advantage of skill building programs. Many of the recommendations listed by Cohen (1988) to improve student retention at community colleges are already in place at the college.

The results of this study suggest that using withdrawal as an early warning signal might identify some of the at-risk students earlier. Further, the results strongly confirm the need to make faculty continuously aware of their important role in student retention. Encouraging faculty members to use the existing college referral programs for weak students might help identify marginal students before

they become part of that group of non-successful students with low grade-point averages.

The results of this study strongly support what Bean, Pascarella, Webb and others have discovered: different factors influence commuter student persistence when compared to persistence of residential students. Concerns about social integration and institutional fit do not seem important at commuter colleges. The fact that not a single student from the survey found the social life to be a positive factor in his/her success illustrates this fact.

Recommendations

The results of this study can be used as baseline information for future studies. To better understand exactly what happens to community college students over time, a longitudinal study of current freshman students should be initiated. This longitudinal study might track a sample of from 100-200 students from the time they originally enter the college for a period of five years. Qualitative, in-depth data could be obtained to discover their failures and successes. Exactly how faculty influence them in pursuing a degree could be explored.

Since academic integration is a strong predictor of student retention, more individualized efforts with academically at risk students, as suggested by IBHE reports, are clearly needed. As stated by Bean (1987) "Retention programs must serve individual students."

Efforts to retain students should not just occur at the beginning of the student's college career. Students do not drop out only after the first semester. Retention efforts should take place throughout the

student's college experience.

The focus on academic performance should be a comprehensive initiative, involving faculty members, administrators, counselors and others. The provision of such assistance would not be viewed solely as the responsibility of student services. All parts of the institution, especially individual faculty members, should take an active role in retention efforts.

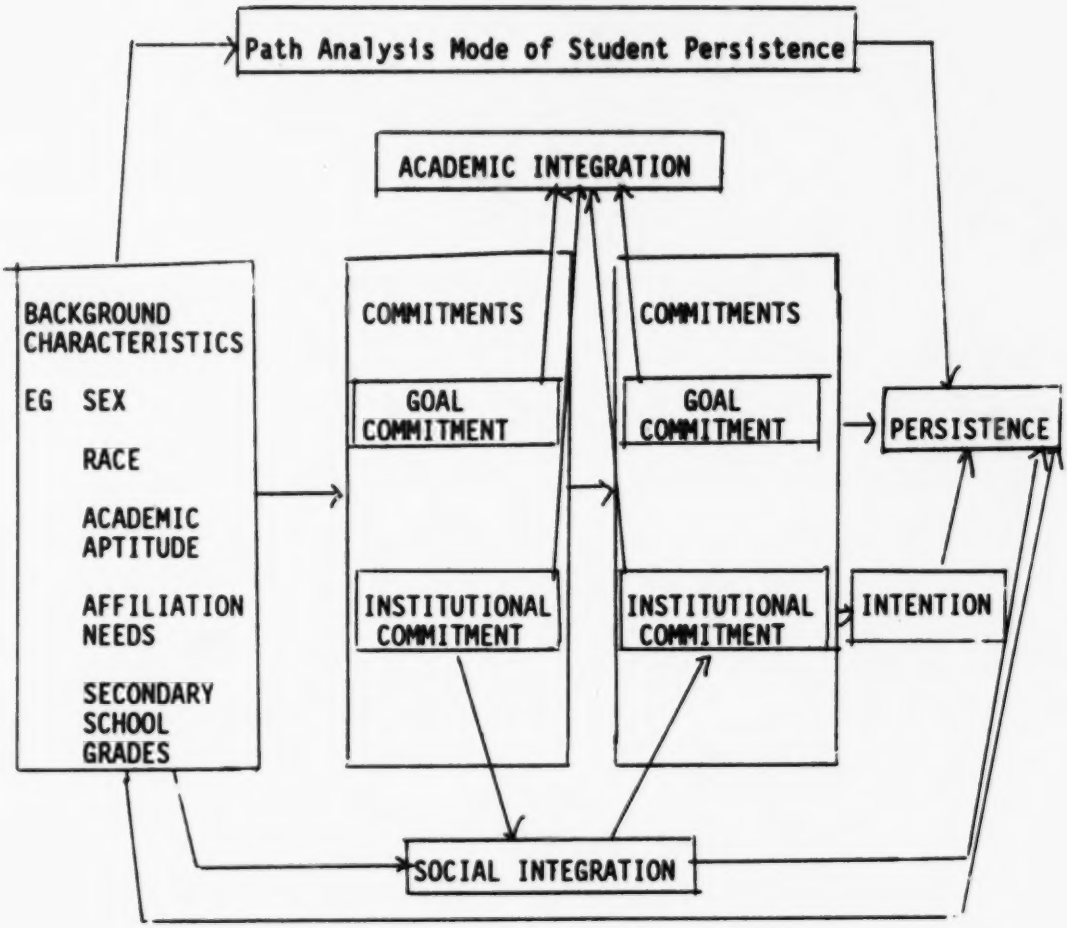
Faculty need to identify at-risk students prior to mid-semester and direct these students to labs and student services programs where they can get the appropriate assistance.

Each faculty member should take an active role in encouraging students to stay in school. A student who has been absent more than two times should be called by the faculty member.

Faculty advisors need to receive inservice training in order to better advise transfer students. Faculty should be made accountable in the evaluation process for their role in student retention efforts.

Another approach might be to have selected faculty members (with reduced teaching loads) in each department appointed as "mentors or advisors" with the responsibility of monitoring, counseling, and tutoring all students who are in trouble academically.

Attachment A



Pascarella, Dubi and Iverson's suggested reconception of Tinto's model

Attachment B

Telephone Survey Graduate or transfer___ Attending___
ID number___ REACHED ___
Name_____ Social Security Num:_____
Phone_____
Dates of attempts ___ ____ ____
Phone comments:

Talked with student__ Other person ____

1. Are you/is person
   In school
   Full time____
   part time _____
   where _____
2. If student: when do you plan to graduate? _____
3. What is your current goal/intention?
   School: Degree AS ____
   BS ____
   other ____
8. Working
   Full time ____
   More or = 20 hrs/week _____
   Less than 20 hrs/wk _____
9. If graduate: are you working in degree area?
10. Work: Better job ___
    Return to school ___
    other ___

4. Which ICC factors had the greatest affect on your success at ICC?
   advisor ____
   teachers____
   social life ____
   location ____
   schedule of classes____
   program offerings ____
   special services for students____ Which?

5. Which personal factors had the greatest positive affect on your school success?
   health___
   family____
   money_____
   work____
   transportation___
   other____

6. Which personal factors were the most difficult to overcome?
   health___
   family___
   money___
   work____
   transportation___
   other___

7. What other assistance could the college have provided to you while you were attending?

Attachment C

SURVEY RESULTS
Telephone Survey Graduate or transfer 38 Attending___
ID number____ REACHED 28

1. Are you/is person
   In school
   Full time 20
   Part time 1
   Where 13 different schools
   (next page)

2. If student: when do you plan to graduate? Spring 91 13
   other 8

3. What is your current goal/intention?
   School: Degree AS 5
   BS 23
   other ___

4. Which ICC factors had the greatest affect on your success at ICC?
   advisor 3
   teachers 15
   social life 0
   location 7
   schedule of classes 3
   program offerings 5
   special services for students 0 Which?

5. Which personal factors had the greatest positive affect on your school success?
   health 0
   family 14
   work 4
   money 4
   transportation 4
   other 3 2 motivation, 1 coach

6. Which personal factors were the most difficult to overcome?
   health 0
   family 0
   work 3
   money 7
   transportation 7
   other 3 not specified
   none 7

7. What other assistance could the college have provided to you while you were attending?
   None 15
   No response 3
   Responses 10
   More optional hours such as math lab
   More grant money available for working students
   Better financial aid
   Better counseling 2
   Better transfer assistance
   More late afternoon classes
   More extensive graphics arts program
   Low cost housing
   Improved health service

8. Working
   Full time 6
   More or = 20 hrs/week 5
   Less than 20 hrs/wk 6
   Not working 11

9. If graduate: are you working in degree area?
   yes 4 no 3

10. Work: Better job 1
    Return to school 1
    other 1

Attachment C (Continued)

List of schools currently attended

Institution	Number of students
Illinois State University	5
Bradley University	2
Northern Illinois University	2
Sangamon State University	2
Eastern Illinois University	1
Florida Atlantic University	1
Mennonite College of Nursing	1
North Dakota State	1
Northeast Missouri State	1
Saint Francis College of Nursing	1
Southern Illinois University	1
Western Illinois University	1
University of Illinois	1

Attachment D

SURVEY RESULTS
Telephone Survey Graduate or transfer Attending 45
ID number____ REACHED 35

1. Are you/is person
In school
Full time 21
Part time 12
Where ICC

2. If student: when do you plan to graduate? December 89 3
Spring 90 19
other 7

3. What is your current goal/intention?
School: Degree AS 15
BS 13
other 5
no response 2

8. Working
Full time 12
More or = 20 hrs/week 13
Less than 20 hrs/wk 5
Not working 5

9. If graduate: are you working in degree area?
yes 4 no 1

10. Work: Better job 2
Return to school
other

4. Which ICC factors had the greatest affect on your success at ICC?
advisor 5
teachers 15
social life 0
location 16
schedule of classes 9
program offerings 6
special services for students 1 Which? Math labs

5. Which personal factors had the greatest positive affect on your school success?
health 0
family 11
work 4
money 5
transportation 6
other 6

6. Which personal factors were the most difficult to overcome?
health 2
family 2
work 5
money 4
transportation 2
other 1 adjustment
none 21

7. What other assistance could the college have provided to you while you were attending?
None 23
No response 3
Responses 9

Better counseling 3
More teacher availability
Improved social life
Easier registration
Better transfer assistance
Housing
More reasonably priced meals

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